REMARKS

In view of the foregoing amendments and following remarks, reconsideration of this application and early allowance of the application is respectfully requested.

Claims 1-6 stand rejected under 35 U.S.C. § 103(a) as being obvious over Kunze U.S. Patent No. 4,047,283 in view of Schneider U.S. Patent No. 4,377,323. Claims 2-6 have been cancelled without prejudice. Claim 1 has been amended to more particularly point out and distinctly claim Applicants' invention. No new matter has been introduced.

Because Applicants have cancelled claims 2-6 from the present application without prejudice, the Examiner's rejection of claims 2-6 as set forth in the Office Action is rendered moot. Notice to this effect is requested.

Turning now to the Examiner's rejection of claim 1 under 35 U.S.C. §103(a) as being obvious over Kunze in view of Schneider, Applicants respectfully traverse this rejection for the reasons detailed below. Significant differences exist between Applicant's claimed invention and the Kunze and Schneider patents which prevent these patents, whether taken alone or in combination, from disclosing, yielding or even suggesting Applicants' claimed invention.

As set forth in detail in the present application, Applicants' invention is directed to embodiments of a new optical fiber splicer and associated splicing method. The optical fiber splicer according to the present invention includes abutment and pressure-contact means (and a drive mechanism) which can slide terminal portions of retained optical fibers to be spliced in mutually opposite directions along a V-shaped groove formed in a block of the splicer. Substantially equal elastic forces can thereby be produced in the terminal portions of the fibers, bringing the terminal portions into abutment and pressure contact.

The abutment and pressure-contact means include a slide member having one end fixed to the underside of the block and the other end including a laterally extending arm. A shaft is provided having a dial (operable for raising and lowering the block) and an eccentric cam coaxially fixed on the shaft and axially supported by a base. Tension springs are provided, connected between the arm of the slide member and the base, for energizing the slide member toward the eccentric cam. When the dial is rotated, the rotation is transmitted through the shaft to the eccentric cam causing progressive movement of the slide member under the force of the tension springs. The block, which is attached to the slide member, thereby can be moved toward the terminal portions of the optical fibers to be spliced.

The amount of elongation (elongation percentage) of the tension springs can be set to prevent breakage of the optical fibers by pressure contact forces that exceed the stress tolerance of the fibers. That is, the tension springs can function as a pressure limiting mechanism.

Thus, the apparatus according to the present invention enables optical fibers to be spliced with high precision, i.e., with substantially no offset between the centers of their terminal portions, without the need for connector or matching oil. Moreover, since the optical fibers are pressed together by elastic force, the conditions of the splicing can be made identical even among the individual fibers of a multi-filament fiber bundle.

The present inventors, having invented and developed such a new and non-obvious apparatus, are therefore entitled to appropriate patent protection for their invention and contribution to the art.

Applicants have amended claim 1 to more particularly point out and distinctly claim the foregoing arrangement. Particularly, claim 1 now affirmatively recites the block (with V-shaped groove) and abutment and pressure-contact means.

As now explained, a review and reading of the Kunze and Schneider patents makes clear that these patents, whether taken alone or in combination, do not yield, teach or even suggest Applicants' optical fiber splicer apparatus as now claimed.

The Kunze patent describes a method and apparatus for splicing light waveguides. As acknowledged by the Examiner in the Office Action, Kunze does not disclose abutment and pressure-contact means for sliding the terminal portions of the fibers to be spliced in mutually opposite directions with substantially equal elastic forces to bring the terminal portions into abutment and pressure contact. Accordingly, Kunze does not teach or suggest Applicants' apparatus as claimed in claim 1 as now amended, and notice to this effect is earnestly solicited.

Schneider does not overcome the severe deficiencies of Kunze. The combination of Schneider with Kunze does not yield, teach or suggest the present invention as now claimed.

Schneider describes a device for splicing light waveguides. Schneider is particularly concerned with improving the support structure for the axles of the waveguide holding devices and providing means for controlling the movement of the axles (see col. 2, lines 42-47) to control the spacing between the axles. The axles (11) of the holding devices (4) are displaceable toward or away form one another with the assistance of a ball bearing support (12). To control axle movement and spacing, cam links (14) supported adjacent to a conventional vertically movable support (9) for supporting a conventional splicing element (6) having a centering groove (5) are provided. An arm (15) is secured to each holding device and includes a cam follower (17) engaged with the respective cam link.

This is not the abutment and pressure-contact structure of the present invention as affirmatively recited in claim 1 of the present application as amended. More particularly, Schneider does not describe or suggest abutment and pressure-contact means including a slide member having an end fixed to the undersurface of the splicing element or block and another end having a laterally extending arm, a shaft provided with means for adjusting the vertical position of the block and an eccentric cam coaxially fixed on the shaft, a base for axially supporting the eccentric cam, and tension springs connected between the arm of the slide member and the base for energizing the slide member toward the eccentric cam, the tension springs serving as a pressure limiting mechanism to prevent breakage of the fibers by pressure contact forces that exceed the stress tolerance of the fibers, as now affirmatively claimed in amended claim 1.

In view of the foregoing, it is respectfully submitted that one of ordinary skill in the art who reads and understands Kunze and Schneider would not be inclined, let alone equipped, to arrive at the present invention as claimed in claim 1 as now amended. Accordingly, Applicants request that the rejection of claim 1 under 35 U.S.C. §103(a) be withdrawn, and notice to the effect that claim 1 is patentable over Kunze and Schneider is earnestly solicited.

On the basis of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for immediate allowance, and notice to this effect is earnestly requested. The Examiner is invited to contact Applicants' undersigned attorneys at the telephone number set forth below if it will advance the prosecution of this case.

No fee is believed due with this Response. Please charge any fee deficiency to the undersigned attorneys' Deposit Account No. 50-0540.

Respectfully submitted,

By: _____

Randy Lipsitz, Esq.
Registration No. 29,189
Richard L. Moss, Esq.
Registration No. 39,782
Attorneys for Applicants
KRAMER LEVIN NAFTALIS & FRANKEL LLP
919 Third Avenue
New York, New York 10022
(212) 715-9100

APPENDIX

CLAIM AMENDMENTS HIGHLIGHTED

1. (Amended) An optical fiber splicer comprising:

a pair of retaining means for retaining optical fibers to be spliced;

a block having a groove of V-shaped cross-section; and

abutment and pressure-contact means for sliding terminal portions of [the]said optical fibers in mutually opposite directions along [a]said groove of V-shaped cross-section[,] producing substantially equal elastic forces in [the]said terminal portions, bringing [the]said terminal portions into abutment[,] and bringing [the]said abutted terminal portions into pressure contact, said abutment and pressure-contact means including a slide member having a first end fixed to the undersurface of said block and a second end having a laterally extending arm, a shaft having means for adjusting the vertical position of said block and an eccentric cam coaxially fixed on said shaft, a base for axially supporting said eccentric cam, and tension springs connected between said arm of said slide member and said base for energizing said slide member toward said eccentric cam, the amount of elongation of said tension springs capable of being set to avoid breakage of said fibers by pressure contact forces that exceed the stress tolerance of said fibers.